GE SRTP OPC Server Manual

October 2008

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doc@gefanuc.com

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GE SRTP OPC Server

The GE SRTP OPC Server is intended for process control engineers, integrators, and developers responsible for the interface and communications with the process control software.

The following chapters provide the information you need to install, set up, and run the GE SRTP OPC Server.

- Introduction
- Getting Started
- Configuration
- OPC Data Items
- Diagnostics
- Troubleshooting
- OPC Compliance
- Appendices

Introduction

The OPC Server for GE SRTP provides connectivity to any SRTP device, such as a Series 90™-70 PLC, a PACSystems™ RX7i, or a PACSystems™ RX3i.

The OPC server connects to multiple devices at the same time. Each read/write with the devices is optimized to maximize throughput.

The OPC Server for GE SRTP includes the following features:

- Read/Write access to all OPC Server for GE SRTP items.
- Optimized for data acquisition.
- Support for all common GE memory addressing formats: (%R, %AI, %AQ, %I, and so on).
- Symbol browsing and addressing (PACSystems™ RX7i and PACSystems™ RX3i only).
- Fault table reading.
- Runs as a Windows Service.

Who Should Use This Manual

This manual is intended for all users of the **OPC Server for GE SRTP**. It explains how to install and configure the software as well as how to perform common tasks. Technical information about OPC data items is also included, along with sections on diagnostics and troubleshooting.

Overview of Manual

This manual consists of several chapters and is structured as follows:

- Getting Started: provides instructions for installing the OPC server and how to contact GE Fanuc's support group.
- Configuration: shows how to start and configure the OPC server, and describes each component in detail, including the windows, panels, and menu commands.
- OPC Data Items: describes the OPC server's items.
- Diagnostics: explains how to use logging, statistical items, data qualities, timestamps, and result codes to get the most efficiency from your system.
- Troubleshooting: provides solutions for common problems you may encounter and answers frequently asked questions.
- OPC Compliance: details the OPC server's compliance with regard to installation common interfaces and data access.
- Appendices: cover DCOM, aliases, standard data types, and data types in common products.

References

Service Request Transfer Protocol 2 (SRTP2) protocol specification, version 1.08,

Pendulum Service Request Interface PIDD, version 1.3,

GFK-0529C - Series 90 PLC SNP Communications User Manual.

Getting Started

This chapter contains important information about installing the OPC server and contacting GE Fanuc Customer Support.

The System Requirements section shows how to avoid future problems by ensuring that your system meets the minimum software and hardware requirements. Detailed, step-by-step instructions in the Installation section take you through the installation process and lists the files that are installed during this process. If you have any problems during the installation of the OPC server, the Contacting Support section shows how to contact GE Fanuc Customer Care for assistance.

System Requirements

The OPC server has both Software and Hardware minimum system requirements. These requirements must be met in order for the OPC server to work properly.

Software Requirements

The OPC server requires, at a minimum, the following software:

- Windows XP Professional Service Pack 2
- Windows 2003 Service Pack 1
- Microsoft Windows 2000 Service Pack 2
- Microsoft Windows NT 4.0 Service Pack 6
- Internet Explorer 6.0 Service Pack 1 (or better)

Other Software Requirements

- Proficy Machine Edition version 5.9 and PACSystems Firmware version 5.60 are required to create Diagnostic Logic Blocks (not yet released as of August 2008)
- Proficy Machine Edition version 5.8 and PACSystems Firmware version 5.50 are required to create LREAL variables

Hardware Requirements

The OPC server requires, at a minimum, the following hardware:

- Intel Pentium III 450MHz
- 256MB RAM

Supported PACSystems™ RX3i are as follows:

- PACSystems™ RX3i CPU310 (part number IC695CPU310), using a 300-MHz CPU.

Supported PACSystems™ RX7i Firmware version 2.00 and earlier devices are as follows:

- PACSystems™ RX7i CPE010 (part number IC698CPE010), using a 300-MHz CPU with an

Embedded Ethernet interface.

- PACSystems™ RX7i CPE020 (part number IC698CPE020), using a 700-MHz CPU with an Embedded Ethernet interface.
- PACSystems™ RX7i CRE020 (part number IC698CRE020), using a 700-MHz CPU with an Embedded Ethernet interface (Redundancy Support).

Supported PLCs are as follows:

- Series 90™-70 with Ethernet
- Series 90™-30 with Ethernet
- VersaMax® with Ethernet

The OPC server requires the following additional hardware in order to make use of the corresponding functionality:

- IP compatible network

Installation

To install the OPC server, perform the following steps:

1. Insert the **OPC Server for GE SRTP** CD into your CD drive.
2. If the **GES OPC Server Setup** dialog box does not appear automatically, double-click the **`Setup.exe`** file. The **GES OPC Server Setup** dialog box (Figure2-1) appears.

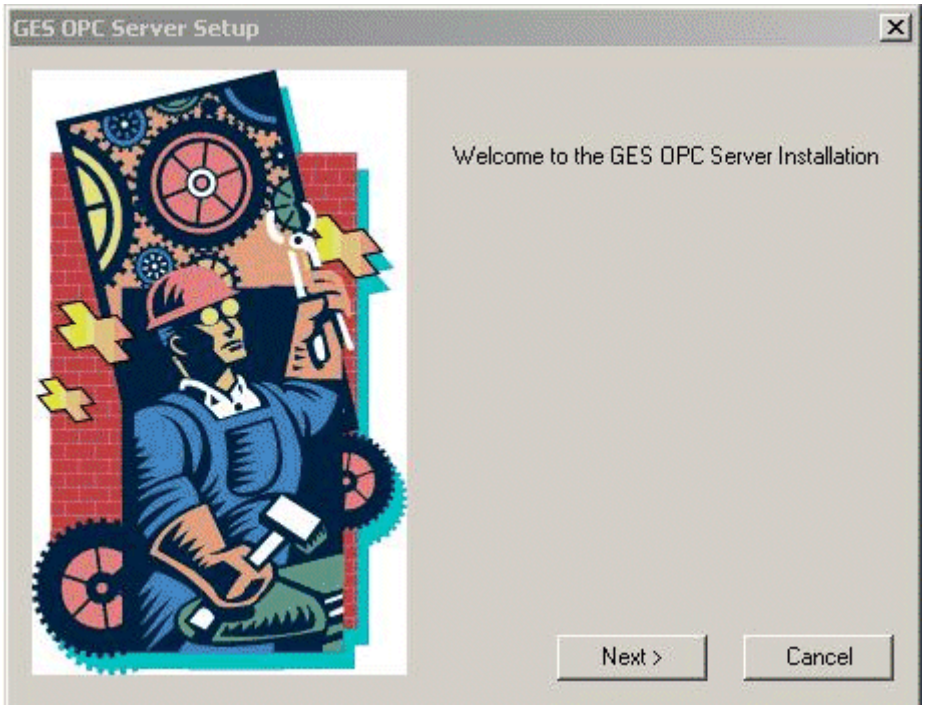

Figure 2-1. The GES OPC Server Setup dialog box.

3. Click **Next**. The **GES OPC Server License Agreement** dialog box (Figure 2-2) appears.

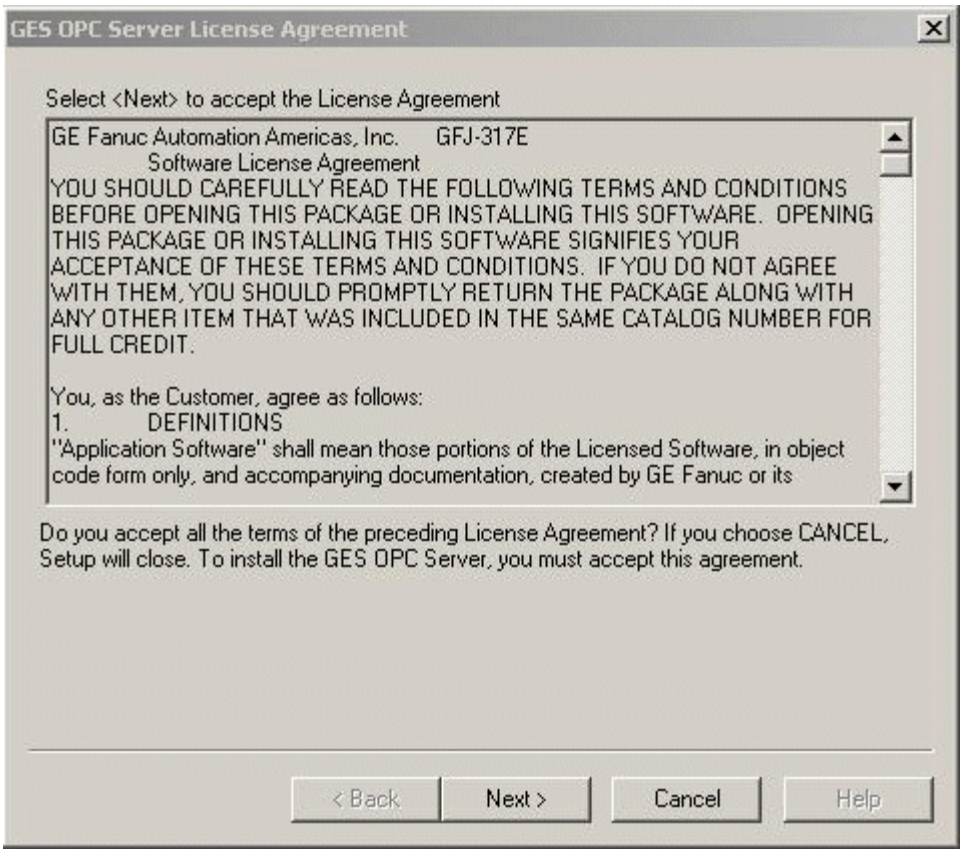
GES OPC Server License Agreement
Select <Next> to accept the License Agreement
GE Fanuc Automation Americas, Inc. GFJ-317E
Software License Agreement
YOU SHOULD CAREFULLY READ THE FOLLOWING TERMS AND CONDITIONS BEFORE OPENING THIS PACKAGE OR INSTALLING THIS SOFTWARE. OPENING THIS PACKAGE OR INSTALLING THIS SOFTWARE SIGNIFIES YOUR ACCEPTANCE OF THESE TERMS AND CONDITIONS. IF YOU DO NOT AGREE WITH THEM, YOU SHOULD PROMPTLY RETURN THE PACKAGE ALONG WITH ANY OTHER ITEM THAT WAS INCLUDED IN THE SAME CATALOG NUMBER FOR FULL CREDIT.
You, as the Customer, agree as follows:
1. DEFINITIONS
"Application Software" shall mean those portions of the Licensed Software, in object code form only, and accompanying documentation, created by GE Fanuc or its
Do you accept all the terms of the preceding License Agreement? If you choose CANCEL, Setup will close. To install the GES OPC Server, you must accept this agreement.
< Back
Next >
Cancel
Help

Figure 2-2. The GES OPC Server License Agreement dialog box.

4. Read the **GES OPC Server License Agreement**, using the scroll bar to view the entire message, and print it out for future reference. Click **Next**, or, click **Cancel**. If you click **Next**, the **Important Product Information** file appears in a separate window.
5. Read the Important Product Information and print it out for future reference.
6. Close the **Important Product Information** file. A message box (Figure 2-3) appears asking if you want to proceed with the installation.

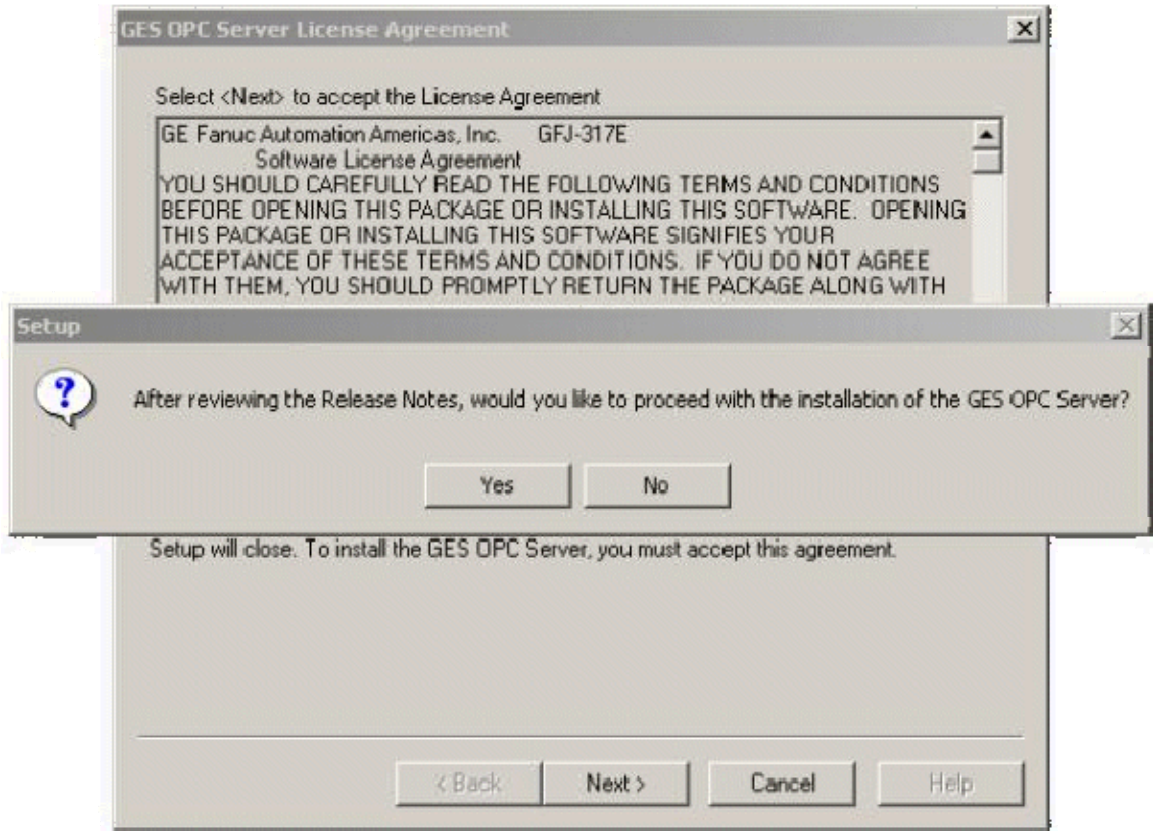
GES OPC Server License Agreement
Select <Next> to accept the License Agreement
GE Fanuc Automation Americas, Inc. GFJ-317E
Software License Agreement
YOU SHOULD CAREFULLY READ THE FOLLOWING TERMS AND CONDITIONS
BEFORE OPENING THIS PACKAGE OR INSTALLING THIS SOFTWARE. OPENING
THIS PACKAGE OR INSTALLING THIS SOFTWARE SIGNIFIES YOUR
ACCEPTANCE OF THESE TERMS AND CONDITIONS. IF YOU DO NOT AGREE
WITH THEM, YOU SHOULD PROMPTLY RETURN THE PACKAGE ALONG WITH
Setup
After reviewing the Release Notes, would you like to proceed with the installation of the GES OPC Server?
Yes
No
Setup will close. To install the GES OPC Server, you must accept this agreement.
< Back
Next >
Cancel
Help

Figure 2-3. The Important Product Information message box.

7. Click **Yes** on the message box. The **GES OPC Server Setup** dialog box (Figure 2-4) appears.

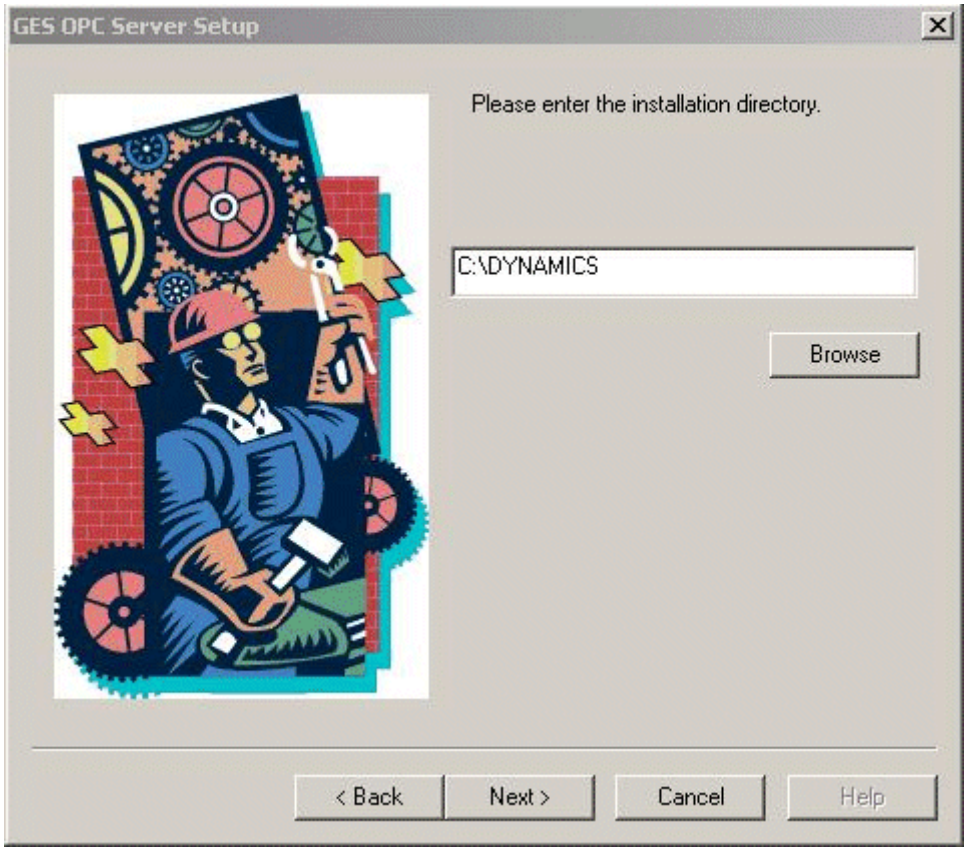

Figure 2-4. The GES OPC Server Setup dialog box.

8. Click **Next** to install the OPC server files into the default location. Alternatively, click **Browse** to navigate to a different installation folder. The **GES OPC Server Setup** dialog box changes (Figure 2-5) to allow you to select the program group you want to install the OPC Server icons in.

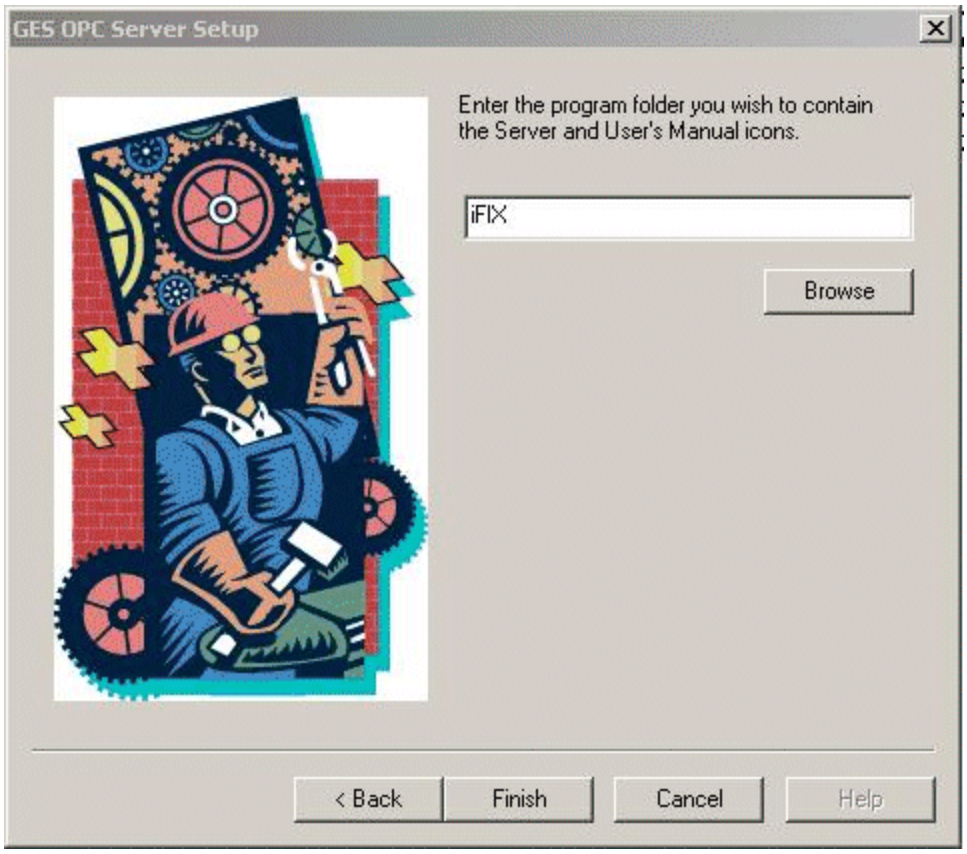

Figure 2-5. The GES OPC Server Setup dialog box.

9. Click **Finish** to add the OPC server icons to the default program group and to install the GES OPC Server. Alternatively, click **Browse** to select another program group, or click the **Back** button to change any of the installation information.

The GES OPC Server is installed. When complete, the **GES OPC Server Setup** dialog box shows that the installation was successful. (Figure 2-6)

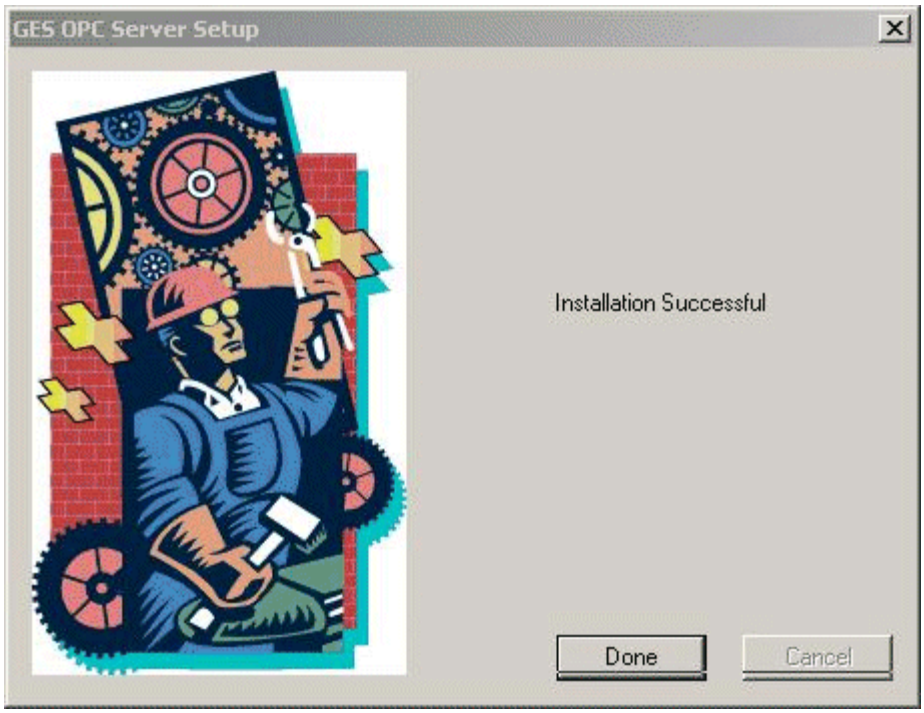

Figure 2-6. The GES OPC Server Setup dialog box.

10. Click the **Done** button.

By default, the files in Table 2-1 are installed in:

```
C:\Dynamics\GESOPCServer
```

Table 2-1. Installation Files Installed in C:\Dynamics\GESOPCServer

File Name	Description
GEEULA.txt	GE Fanuc End User License agreement
GES.chm	Users manual
GES.inf	Setup information file
GEUninstall.exe	Uninstall program for the OPC server
GESRel.htm	Important Product Information including release notes
OEM_GE_OPC.dll	GE OPC OEM badge library

File Name	Description
OPCAuto.dll	OPC Automation Component – enables developers to access OPC data from OPC client applications developed using Automation tools such as *Visual Basic*, *VBA*, and *VB Script*
OPCGETcpipSA.exe	OPC server executable
PSTCFG.exe	Product configuration utility
PSTCFGGeTcpipLib.ocx	OPC server ActiveX configuration panels
PSTcfgps.dll	Product configuration marshalling library

By default, the files in Table 2-2 are installed in:

```
C:WINNT/SYSTEM32
```

Table 2-2. Installation Files Installed in the WINNT/ SYSTEM32 Folder

File Name	Description
OPCcomn_ps.dll	OPC Common interfaces and marshalling library
OPC_aeps.dll	OPC application extension
OPCenum.exe	OPC server list component
OPCProxy.dll	OPC Data Access 2.0 and 1.0a interfaces and marshalling library
ExprEval.dll	Expression Evaluation library for Alias Scaling Equations

Contact GE Fanuc

If you purchased this product through a GE Fanuc Authorized Channel Partner, please contact them directly.

General Contact Information

Online Technical Support & GlobalCare: www.gefanuc.com/support

Comments about our manuals or online help: doc@gefanuc.com

Additional information: www.gefanuc.com

Technical Support

If you have technical problems that cannot be resolved with the information in this guide, please contact us by telephone or email, or on the web at www.gefanuc.com/support.

Americas

Online Technical Support: www.gefanuc.com/support

Phone: 1-800-GE FANUC (1-800-433-2682)

International Americas Direct Dial: 1-434-978-5100

Technical Support Email: support@gefanuc.com

Customer Care Email: customer.care@gefanuc.com

Primary language of support: English

Europe, the Middle East, and Africa (EMEA)

Online Technical Support: www.gefanuc.com/support

Phone: +800 1 GE FANUC (+800-1-433-2682)

Technical Support Email: support.emea@gefanuc.com

Customer Care Email: customercare.emea@gefanuc.com

Primary languages of support: English, French, German, Italian, Czech

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- +86-21-3217-4826 (India, Indonesia, and Pakistan)

Technical Support Email:

- support.cn@gefanuc.com (China)
- support.jp@gefanuc.com (Japan)
- support.in@gefanuc.com (remaining Asia customers)

Customer Care Email: customercare.apo@gefanuc.com

Configuration

The OPC servers graphical user interface allows users to view and alter configuration parameters at runtime. When viewing a configuration parameter, the current setting is retrieved from the OPC server and displayed. When changes are submitted, updated parameters are sent to the OPC server as a group.

Only a small amount of configuration of the OPC Server for GE SRTP is required in order for it to run properly, but users can customize the OPC servers behavior in greater detail as required. This chapter shows how to start and configure the OPC server and describes each component in detail, including the windows, panels, and menu commands.

The first section, Starting the OPC Server for GE SRTP, shows how to start the software. The next four section describe The Tool Tray Menu, The Control Panel, The Configuration Window, and The Options Dialog Box in detail. Instructions for configuring the OPC Server for GE SRTP appear in the OPC Server Configuration section. The Alias Configuration section shows how to create user-defined aliases in place of regular OPC items.

Starting the OPC Server for GE SRTP

Start the OPC server using the shortcut under the GES OPC Server program folder in the Windows Start menu. In addition, the OPC server automatically starts when an OPC client first tries to connect to it. If the OPC server is installed as a Windows 2000/NT service, you can also start it using the Service Control Manager applet (under the Windows 2000/NT Control Panel, Administrative Tools).

If the OPC server is not installed as a Windows 2000/NT service, the OPC Server for GE SRTP welcome screen appears briefly when the OPC server starts up.

To start the OPC Server for GE SRTP :

- Click the Windows Start button, point to Programs, point to GES OPC Server**,** and click GE Fanuc SRTP (GES) OPC Server **.**

  The OPC server starts and the *OPC Server for GE SRTP* logo appears in the Tool Tray (Figure 3-1), located, by default, at the bottom right of the Windows desktop.

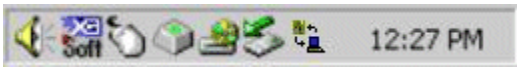


Figure 3-1. The Tool Tray.

The Tool Tray Menu

The Tool Tray Menu provides access to the Control Panel, the Configuration Window, Online Help, and the About screen. It also contains the command to shut down the OPC server.

To view the Tool Tray Menu:

- Right-click the *OPC Server for GE SRTP* logo . The Tool Tray Menu appears (Figure 3-2).

Figure 3-2. The Tool Tray Menu.

Table 3-1 describes the commands in the Tool Tray Menu.

Table 3-1. The Tool Tray Menu

Command	Description
Show Control Panel	Display the configuration control panel (see section ***).
Configure	Display the main configuration window (see section ***).
Shutdown	Shut down the OPC server.
About	Display the OPC servers welcome screen, which includes information about the software.

NOTE: *If the OPC server is installed as a Windows 2000/NT service, the Tool Tray and the Tool Tray Menu are not available.*

The Control Panel

The Control Panel displays the OPC servers status, the time and the number of OPC clients. It also provides access to the Configuration Window and the About screen and lets you shut down the OPC server.

The Control Panel stays on top of every other window on the desktop to help you monitor the status of the OPC server.

To view the Control Panel:

1. Right-click the *OPC Server for GE SRTP* **logo** . The Tool Tray Menu appears.
2. From the Tool Tray Menu, select Show Control Panel. The Control Panel appears (Figure 3-3).

Figure 3-3. The Control Panel.

3. To shrink the Control Panel **so that it displays onl**y the OPC client count, double-click the title bar.

Table 3-2 describes the commands in the Control Panel.

Table 3-2. The Control Panel

Command	Description
Status	Display the current status of the OPC server.
Time	Display the current time.
Clients	Display the total number of OPC clients presently connected to the OPC server.
Configure	Display the main configuration window.
Shutdown	Shut down the OPC server.
About	Display the OPC servers Welcome screen, which includes information about the software.

NOTE: *If the OPC server is installed as a Windows NT/2000 service, the Control Panel is not available.*

The Configuration Window

The **Configuration Window** is used to configure the OPC server. It displays the current configuration and allows you to change configuration parameters.

To view the Configuration Window:

- From the **Tool Tray Menu** or the **Control Panel**, select **Configure**. The **Configuration Window** appears (Figure 3-4).

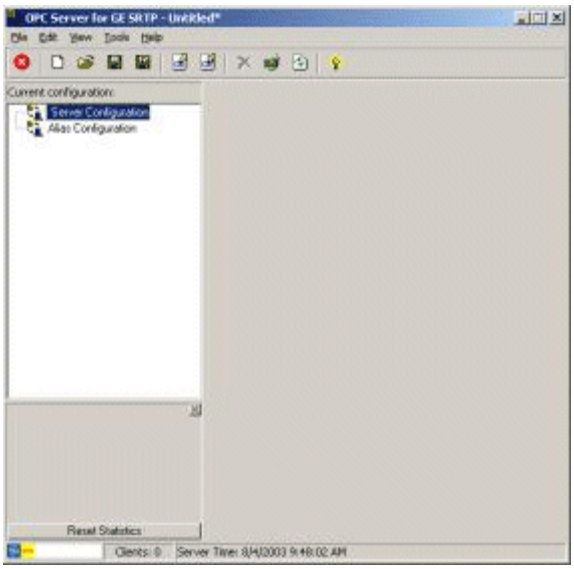


Figure 3-4. The Configuration Window.

Table 3-3 describes the commands in the **Configuration Window**.

Table 3-3. The Configuration Window

Command	Description
Main menu	Provides access to the File, Edit, View, Tools, and Help menus.
Main toolbar	Provides shortcut buttons for commands in the main menu (context-sensitive).
Current configuration	Displays a tree of configuration objects currently defined in the OPC server. Select an object to display its current settings in the right-hand panel. ***Caution:*** *When you right-click in the Current Configuration tree, do* **NOT** *select* ***Set as Default****. If you select Set as Default, most items from clients will not validate.*
Server Configuration	Objects under this node affect how the OPC server communicates with the data source.
Alias Configuration	Defines aliases and alias groups under this node.
Object settings panel	Displays the current settings of the object presently selected in the tree.

Table 3-3. The Configuration Window	
Command	**Description**
Statistics panel	Displays available statistics for the object presently selected in the tree: Sent, Received, Timed out, Retried, Failed, Overrun. See the Diagnostics section for more details.
Reset Statistics	Resets statistics on the object presently selected in the current configuration tree.
GE Fanuc logo	Double-click to open a link to the GE Fanuc web site.
Clients	Displays the total number of OPC clients presently connected to the OPC server.
Server Time	Displays the current time.

NOTE: *If the OPC server is installed as a Windows 2000/NT service, the* ***Tool Tray Menu*** *and* ***Control Panel*** *are not available. In this case, use the Windows* ***Start*** *menu to open the* ***Configuration Window****.*

The following sections describe the menus that are contained in the **Configuration Window** and what they are used for:

The File Menu

Table 3-4 describes the commands in the **File Menu**.

Table 3-4. The File Menu	
Command	**Description**
New	Clears the current configuration and start a new one. Prompts the user for confirmation before continuing if OPC clients are still connected to the OPC server.
Open	Clears the current configuration and load a new one from an existing file. Displays the Open Configuration dialog box to prompt for the file name. Prompts for confirmation before continuing if OPC clients are still connected to the OPC server.
Save	Saves the current configuration to an XML file. Displays the Save Configuration dialog box to prompt for a new file name if the configuration is new and has not been saved before.

Table 3-4. The File Menu	
Command	**Description**
Save As	Saves the current configuration to an XML file. Displays the Save Configuration dialog box to prompt for a new file name.
Export Aliases	Exports all currently configured aliases to a CSV file. Displays the Export Aliases dialog box to prompt for a file name.
Import Aliases	Clears all aliases and import new ones from a CSV file. Displays the Import Aliases dialog box to prompt for an existing file name.
Shutdown Server	Closes the current configuration and shut down the OPC server after signalling the shutdown event to all connected OPC clients. Prompts for confirmation before continuing if OPC clients are still connected to the OPC server.
Close	Hides the main configuration window. The OPC server shuts down after a short delay if no OPC clients are currently connected to the OPC server.

The Edit Menu

Table 3-5 describes the commands that appear in the **Edit Menu** when the currently selected object appears under the **OPC Server Configuration** node.

Table 3-5. The Edit Menu in the OPC Server Configuration Node	
Command	**Description**
Undo/Cant Undo	Not available in this product
Set As Default	Sets the currently selected object as the default.
Delete	Removes the currently selected object from the OPC server configuration. Prompts for confirmation before continuing if OPC clients have references to items associated with the selected object or one of its children. This does not remove such objects but simply disables them and sets them to marked for deletion.
Define New	Displays the Insert New Object dialog box used to create a new configuration object under the currently selected configuration object.

Table 3-6 describes the commands that appear in the **Edit Menu** when the currently selected object

appears under the **Alias Configuration** node.

Table 3-6. The Edit Menu in the Alias Configuration Node	
Command	**Description**
Cant Undo	Not available in this product
Delete Alias Group	Removes the currently selected alias group and all subordinate groups and aliases.
Delete Alias	Removes the currently selected aliases.
	Creates a new alias group under the currently selected alias group.
Insert New Alias	Displays the Insert New Alias dialog box used to create a new alias under the currently selected alias group.

The View Menu

Table 3-7 describes the commands in the **View Menu**.

Table 3-7. The View Menu	
Command	**Description**
Statistics	Displays/hides general communication statistics for the currently selected object.
Properties	Displays the Alias Configuration Properties dialog box used to copy the destination/source and edit each alias group
Reset Statistics	Resets all statistics for the currently selected object to zero.
Defaults	Displays the OPC Server Defaults dialog box used to configure the default settings for the various types of communication objects available in the OPC server.
Refresh	Rebuilds the tree display of the OPC server configuration and fully expands all branches.
Options	Displays the Options dialog box used to change general server options.

The Tools Menu

Table 3-8 describes the commands in the **Tools Menu**.

Table 3-7. The View Menu

Command	Description
DCOM Configurator	Launches the Microsoft Distributed COM Configuration Properties utility. Use this utility to edit DCOM settings for specific COM servers to allow OPC client applications on remote computers to connect to the OPC server.

The Options Dialog Box

The **Options** dialog box is used to edit the OPC servers options. Options are organized into four tabs: **General**, **General Logging**, **Interface Logging**, and **Advanced**. Click a tab to edit its settings.

General Options

The **General** settings allow you to edit general OPC server options.

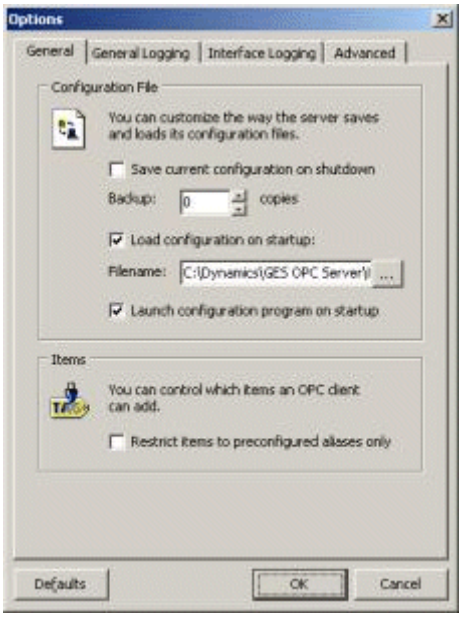


Figure 3-5. The General Options settings dialog box.

Table 3-9 describes the commands in the **General Options** settings dialog box.

Table 3-9. The General Options Settings Dialog Box	
Command	**Description**
Save current configuration on shutdown	Automatically saves the current configuration to the specified file before shutting down if selected.
Backup copies	Automatically stores the specified number of backup copies of the configuration file when saving the configuration.
Load configuration on start-up	Automatically loads a configuration from the specified file when starting up.
Filename	Full path of an existing file for load and save operations. Click the ellipsis button to display the Open dialog box used to select an existing file name.
Launch configuration program on start-up	Automatically launches the configuration utility when starting as a local executable (rather than a Windows NT/2000 service).
Restrict items to pre-configured aliases only	Prevents OPC clients from adding items other than configured aliases.

NOTE: *The OPC server loads these settings from the Windows NT/2000 registry on start-up. To have* ***General Options Settings*** *changes take effect, shut down and restart the OPC server.*

General Logging Options

The **General Logging** settings allow you to edit general logging options.

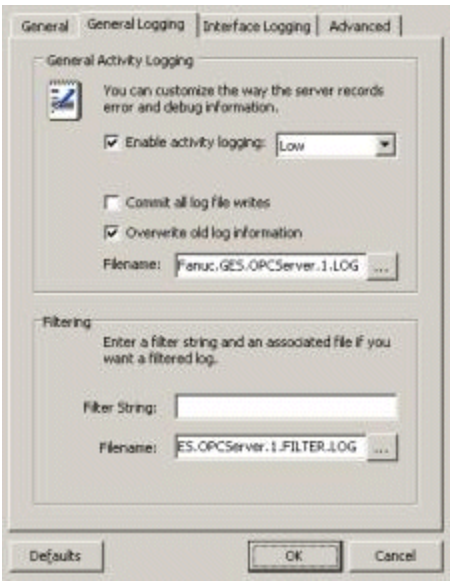


Figure 3-6. The General Logging Options settings dialog box.

Table 3-10 describes the commands in the **General Logging Options** settings dialog box.

Table 3-10. The General Logging Options Settings Dialog Box

Command	Description
Enable activity logging	Enables/disables general activity logging at the specified detail level (High, Medium, Low, or None).
Commit all log file writes	Flushes the file buffer after each message logged. This is useful if the OPC server begins to fail unexpectedly.
Overwrite old log information	Overwrites the old log file each time the OPC server starts. Otherwise, renames the old log file with an underscore (_) prefix.
General Activity Logging Filename	Full path and file name for the general activity log file. Click the ... ellipsis button to enter or select an existing file name. Default path: C:\Dynamics\Common\PSTCFGGEFanuc.GES.OPCServer.1.LOG
Filter String	Match string for filtered log.
Filtering Filename	Full path and file name of the filtered log file. Click the ... ellipsis button to enter or select an existing file name.

NOTE: *General Logging Options Settings take effect immediately.*

Interface Logging Options

The **Interface Logging** settings allow you to view and edit COM interface logging options.

Figure 3-7. The Interface Logging Options settings dialog box.

Table 3-11 describes the items in the **Interface Logging Options** settings dialog box.

Table 3-11. The Interface Logging Options Settings Dialog Box

Command	Description
Enable logging	Enable/disable interface logging at the specified detail level (High, Medium, Low, or None) if selected. Generates a separate log file for each OPC client named PST###.TMP in the OPC server installation directory.
Commit all log file writes	Flush the file buffer after each message logged in case the OPC server is crashing.

***NOTE: Interface Logging Options Settings** take effect when the next OPC client connects to the OPC server.*

Advanced Options

The **Advanced** settings allow you to view and edit advanced OPC server options.

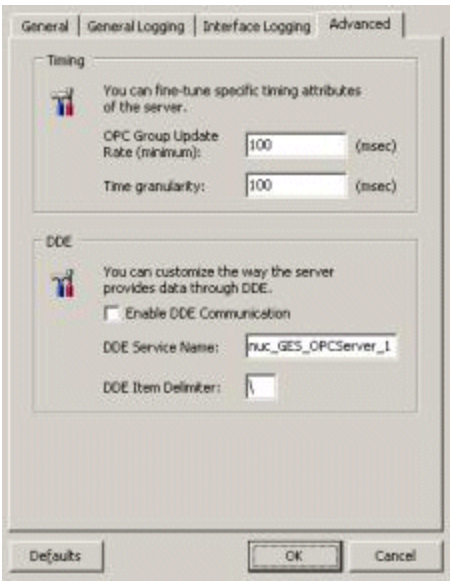


Figure 3-8. The Advanced Options settings dialog box.

Table 3-12 describes the commands in the **Advanced Options** settings dialog box.

Table 3-12. The Advanced Options Settings Dialog Box

Command	Description
OPC Group Update Rate (minimum)	Minimum update rate (milliseconds) allowed for an OPC group. Prevents OPC clients from requesting update rates that are impossible to achieve or that cause heavy CPU loads. Default: 100 ms.
Time granularity	OPC server group scan thread interval (milliseconds). Determines the maximum resolution for data change detection. Time granularity should always be equal to or less than the minimum group update rate.
Enable DDE Communication	Dynamic Data Exchange (DDE) is not supported.
DDE Service Name	Dynamic Data Exchange (DDE) is not supported.
DDE Item Delimiter	Dynamic Data Exchange (DDE) is not supported.

NOTE: *The OPC server loads these settings from the Windows NT/2000 registry on start-up. To have* ***Advanced Logging Options Settings*** *changes take effect, shut down and restart the OPC server.*

OPC Server Configuration

The OPC server requires some configuration in order for it to run properly, but users can customize the

OPC servers behavior as required. This chapter shows how to create and edit objects, using the **Configuration Window.**

Insert New Object

The **Insert New Object** and **Create New** dialog boxes are used to create Channel and Device objects.

The Insert New Object Dialog Box

The **Insert New Object** dialog box (Figure 3-9) displays a different set of options depending on the type of object selected and the types of objects already configured under it.

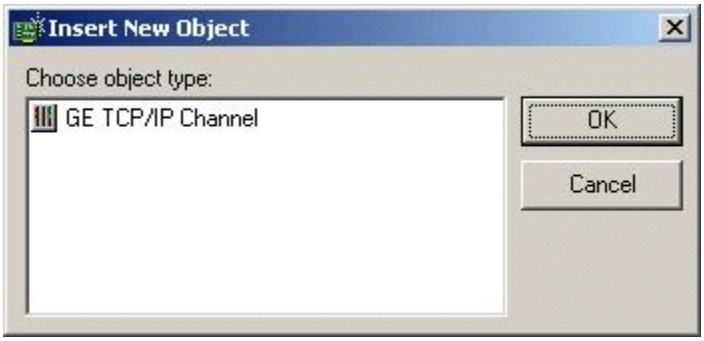


Figure 3-9. The Insert New Object dialog box.

Table 3-13 describes the types of objects that are available for insertion as a child in the **Insert New Object** settings dialog box, depending on which object is currently selected.

Table 3-13. Objects Available Under the Insert New Object Dialog Box

Selected Object	Insert New Object Dialog Box Options
Server Configuration	GE TCP/IP Channel
GE TCP/IP Channel	GE TCP/IP Device

To insert a new object:

1. In the **Configuration Window**, from the **Edit** menu, click or, from the **Edit** menu, choose **Define New**. The **Insert New Object** dialog box (Figure 3-9) appears.
2. Select the type of object you want to create from the list, and then click **OK**. The **Create new** dialog box appears.

The Create New Dialog Box

The **Create New** dialog box (Figure 3-10) displays the settings available for a connection to a GE TCP/IP Channel.

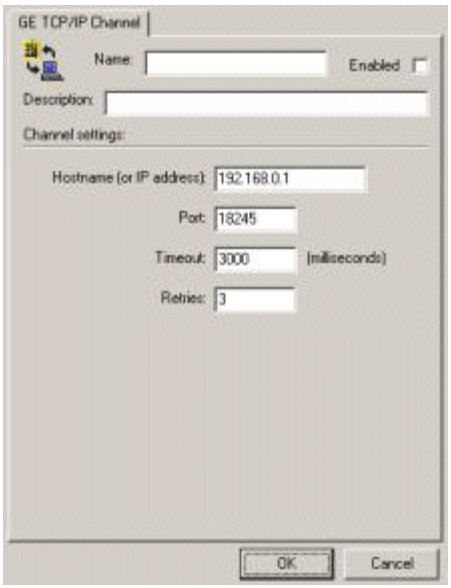


Figure 3-10. The Create New dialog box.

Table 3-14 describes the components of the **Create new** GE TCP/IP Channel box.

Table 3-14. The Create New Dialog Box

Selected Object	Insert New Object Dialog Box Options
Name	Name of the object, which becomes an element of the **item ID** for data items under the object. Automatically converted to title case for display purposes.
Enabled	Enables or disables communication for the object.
Description	Optional, user-defined text (64-character maximum) for documentation purposes.
Hostname	The TCP/IP hostname (or IP address) of the PLCs TCP/IP interface to communicate with.
Port	Port number that the PLCs TCP/IP interface listens on. Default: 18245. This should be sufficient in most cases.
Timeout	How long the OPC server waits for a response on any given communications, in milliseconds. Default: 3000 ms.
Retries	How many times the OPC server attempts to retry a read or write operation before failing the communication operation. Default: 3.

To create a newly inserted object:

1. In the **Create New** dialog box, enter a name for the object. This name is part of the item ID that globally identifies data items under the object. You may also choose to enter a description of the object.
2. Edit the configuration components as desired.
3. Click **OK**. The object is created.

NOTE: *In order to use the object for communication, you must enable the object. This can be done at any time.*

Device Objects

The purpose of the Device object is to give an extra level of organization in the item hierarchy within a particular PLC (named Channel). Other than this, there is no functional configuration required to create a Device, other than to give it a name.

Device objects are configured the same as the Channel objects (described above), except that they require only a name parameter, and must be enabled like the Channel. Any number of Device objects can be configured under a Channel. Each Device object created within the OPC server must have a unique name on the same OPC server.

Remove Objects

You can easily remove any created object, but a warning message (Figure 3-11) appears if you remove an object with data items to which one or more OPC clients hold reference.

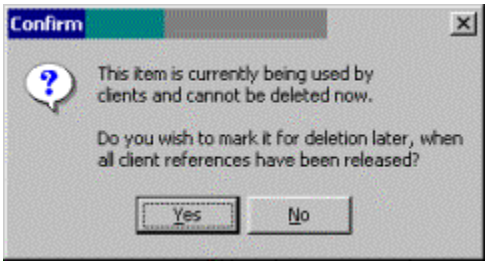

Confirm
This item is currently being used by clients and cannot be deleted now.
Do you wish to mark it for deletion later, when all client references have been released?
Yes
No

Figure 3-11. A warning message is displayed.

To remove an object:

1. In the **Configuration Window**, select the object to be removed under **Server Configuration.**
2. From the **Edit** menu, choose **Delete** or click .

   If one or more OPC clients hold references to data items somewhere under the selected object, a warning message (Figure 3-11) appears.
3. To mark the object for later deletion, click **Yes**. To leave the object unmodified, click **No**.

   Items marked for deletion are disabled, and a red **X** appears over the icon on the right side of the window when the object is selected.

Alias Configuration

OPC Servers, including this OPC server for GE SRTP, provide the ability to create user-defined *aliases* that can be used in place of regular OPC items. This feature is particularly useful when the item

path for a given OPC server is very complex or difficult to remember, for example: `Com1.Radio1.Unit1.41.4.123`.

OPC servers can also be configured so that OPC client applications have access only to configured aliases, rather than every available item.

This chapter shows how to create and edit aliases, using the Configuration Window**.**

***NOTE**: It is not necessary to define aliases before accessing OPC server data items from an OPC client.*

Inserting Aliases

Use the **Insert New Alias** dialog box (Figure 3-12) to insert a new alias into an alias group or on its own, directly under the **Alias Configuration** node.

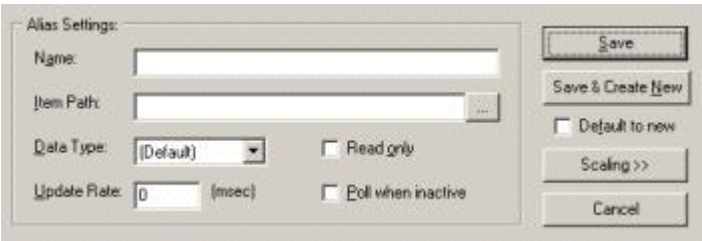


Figure 3-12. The Insert New Alias dialog box.

Table 3-15 describes all the components of the **Insert New Alias** dialog box.

Table 3-15. The Insert New Alias Dialog Box

Field	Description
Name	Name for the alias (unique within the alias group).
Item Path	Fully-qualified item ID for the OPC item to which the alias refers. Click the ... ellipsis button to display the Item Path Browser dialog box used to select an existing OPC item on the OPC server. Alternatively, leave the item path blank to use the alias as a general in-memory variable. When doing so, either define the data type for the alias point as something other than Default, or set the requested data type for reading and explicitly define the data type when writing values to the alias from an OPC client.
Data Type	Coerces the value of the OPC item to the specified type unless (Default) selected. Also serves as the canonical data type for the alias.
Read only	Select to prevent OPC clients from writing values to the alias.
Update Rate	Update rate (milliseconds) to use with the Poll when inactive option. Default: 0.

Table 3-15. The Insert New Alias Dialog Box	
Field	**Description**
Poll when inactive	Continue updating the value for the alias at the specified update rate, even if there are no OPC clients currently accessing the alias.
Save	Saves changes to the alias and hides the dialog box.
Save & Create New	Saves changes to the alias and begins configuring a new one.
Default to new	Select and press ENTER to activate the Save & Create New button rather than the Save button.
Scaling >>	Enables scaling for the alias (displays scaling options).
<< No Scaling	Disables scaling for the alias (hides scaling options).
Cancel	Discard changes to (abandon creation of) the alias and hide the dialog box.

The **Insert New Alias** dialog box can be expanded to display **Scaling Options** (Figure 3-13). Available forms of scaling include: *linear*, *square root*, *gain/offset*, and simple text *expressions*.

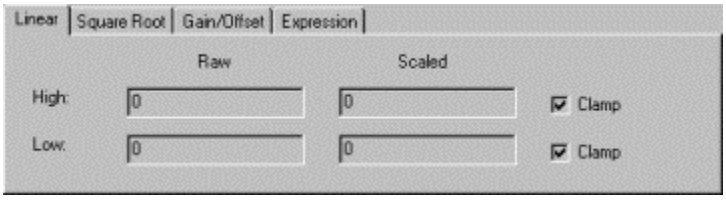


Figure 3-13. Scaling Options for the Insert New Alias dialog box.

Table 3-16 describes the **Scaling Options** for the **Insert New Alias** dialog box.

Table 3-16. The Insert New Alias Dialog Box Scaling Options		
Tab	**Field**	**Description**
Linear & Square Root	Raw High	Maximum expected raw value from the OPC item.
	Raw Low	Minimum expected raw value from the OPC item.
	Scaled High	Maximum desired scaled value for the alias (corresponds to Raw High).

Table 3-16. The Insert New Alias Dialog Box Scaling Options		
Tab	**Field**	**Description**
	Scaled Low	Minimum desired scaled value for the alias (corresponds to Raw Low).
	Clamp High	Clamps the scaled value at the high limit to prevent it from going out of range.
	Clamp Low	Clamps the scaled value at the low limit to prevent it from going out of range.
Gain/Offset	Gain	Scaling factor. (No limits are assumed.)
	Offset	Scaling offset.
Expression	Input	Simple text equation to apply to incoming values (reads). Click the ... ellipsis button to display the Expression Wizard dialog box to help build a formula.
	Output	Simple text equation to apply to outgoing values (writes). Click the ... ellipsis button to display the Expression Wizard dialog box used to help build a formula.

NOTES:

- *The data type for scaled values is double-precision real unless the alias data type is specified.*
- *Using illegal settings, such as **zero-zero** for the high-low range in linear scaling, may be fatal to the OPC server, OPC clients, and communications.*
- *The OPC Item values must be numeric for linear, square root, and gain/offset scaling to work.*
- *The OPC Item values must be non-negative for square root scaling to work. Otherwise, the scaled value is 1 with a bad quality.*
- *The OPC server may be unable to load configuration files containing illegal scaling expressions, and may fail to start properly. If this occurs, rename the configuration file so that the OPC server will not load on start and create a new configuration file. Alternatively, edit the XML file to correct the bad alias settings.*

Editing Aliases

Aliases can be edited after they have been created, using the **Edit Alias** dialog box. This is virtually the same as the **Insert New Alias** dialog box (Figure 3-12), with the exception that it appears after the

alias has been created.

Exporting Aliases

Use the **Export Aliases** dialog box to export all currently configured aliases to a CSV file.

Importing Aliases

Use the **Import Aliases** dialog box to clear all **Aliases** and import new ones from a CSV file.

How Do I

Saving the Configuration

When the OPC server has been configured, use the **Save Configuration** dialog box to save the configuration to an XML file.

To save the configuration to an XML file:

1. From the **File** menu, choose **Save As** or click (alternatively, you can choose **Save** or click). The **Save Configuration** dialog box appears.
2. From the **Save Configuration** dialog box, enter a file name if saving the file for the first time.
3. Click **Save**. The configuration is saved.

Clearing the Configuration

To start a new configuration, clear the configuration as follows:

1. From the **File** menu, choose **New** or click .

   If OPC clients are still connected to the OPC server, a warning message appears.
2. Click **OK**. The configuration is cleared.

Loading a Saved Configuration

To clear the current configuration and load a saved configuration from an existing file:

1. From the **File** menu, choose **Open** or click . The **Open Configuration** dialog box appears.
2. From the **Open Configuration** dialog box, browse for the configuration file to be loaded.
3. Click **Open**. If OPC clients are still connected to the OPC server, a warning message appears.
4. Click **OK**. The old configuration is cleared and the new configuration is loaded from the file.

Shutting Down the OPC Server

Normally, the OPC server automatically shuts down shortly after the last OPC client disconnects from it. However, if the **Configuration Window** is displayed, the configuration utility locks the server so that it will not shut down.

To shut down the server:

1. In the **Control Panel** or the **Tool Tray Menu**, click **Shutdown**. If the OPC server is running as a local executable, from the **File** menu, choose **Shutdown server** or click .
2. If OPC clients are still connected to the OPC server, a warning message appears.
3. Click **OK**. The OPC server is shut down.

NOTE: *The shutdown command is not available for the OPC server if it runs as a Windows NT service. Services can only be shut down from the* ***Service Control Manager*** *applet (in the Windows NT/2000 Control Panel).*

Working with Options

- Editing General Options
- Editing General Logging Options
- Editing Interface Logging Options
- Editing Advanced Options

To edit the General Options:

1. In the **Configuration Window**, from the **View** menu, choose **Options**. The **Options** dialog box appears.
2. From the **Options** dialog box, click the **General** tab to display the **General Options** settings dialog box. The **General Options** settings dialog box (Figure 3-5) appears.
3. Edit the settings, as required. For information on the settings, see Table 3-9.

To edit the General Logging Options:

1. In the **Configuration Window**, from the **View** menu, choose **Options**. The **Options** dialog box appears.
2. From the **Options** dialog box, click the **General Logging** tab to display the **General Logging Options** settings dialog box. The **General Logging Options** settings dialog box (Figure 3-6) appears.
3. Edit the settings, as required. For information on the settings, see Table 3-10.

To edit the Interface Logging Options:

1. In the **Configuration Window**, from the **View** menu, choose **Options**. The **Options** dialog box appears.
2. From the **Options** dialog box, click the **Interface Logging** tab to display the **Interface Logging Options** settings dialog box. The **Interface Logging Options** settings dialog box

(Figure 3-7) appears.

3. Edit the settings, as required. For information on the settings, see Table 3-11.

To edit the Advanced Options:

1. In the **Configuration Window**, from the **View** menu, choose **Options**. The **Options** dialog box appears.
2. From the **Options** dialog box, click the **Advanced** tab to display the **Advanced Options** settings dialog box. The **Advanced Options** settings dialog box (Figure 3-8) appears.
3. Edit the settings, as required. For information on the settings, see Table 3-12.

Working with Aliases

- Inserting Alias Groups
- Renaming Alias Groups
- Inserting New Aliases
- Editing Aliases
- Removing Aliases
- Removing Alias Groups
- Exporting Aliases
- Importing Aliases

To insert an alias group:

NOTE: *Alias groups are used to contain one or more configured aliases.*

1. In the **Configuration Window**, select **Alias Configuration** or a previously configured alias group.
2. From the **Edit** menu, choose **Insert Alias Group** or click . A new alias group folder appears.
3. Enter a new name for the alias group. The alias group is renamed.

To rename an alias group:

NOTE: *Alias groups can be renamed after they have been created.*

1. In the **Configuration Window**, select an alias group.
2. From the **Edit** menu, choose **Rename** or click F2.
3. Enter a new, unique name for the Alias Group. The alias group is renamed.

To insert a new alias:

1. In the **Configuration Window**, select **Alias Configuration** or a previously configured alias group.

***NOTE:** It is usually better to create a new alias under an alias group rather than directly under the **Alias Configuration** node.*

The **Contents** table for that alias group is displayed on the right side of the **Configuration Window** (Figure 3-14), listing the aliases, if any, it contains.

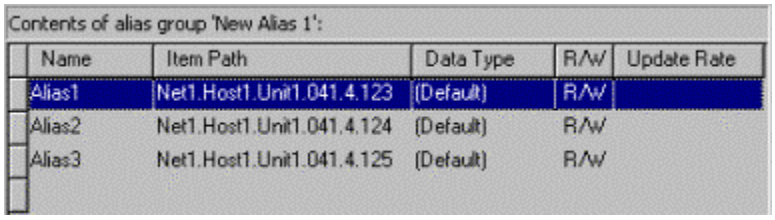


Figure 3-14. The Contents table for the selected Alias Group.

2. From the **Edit** menu, choose **Insert New Alias**. The **Insert New Alias** dialog box (Figure 3-12) appears.
3. Enter a name for the alias in the **Name** text box.
4. Enter the item **Path** and **ID** for the item to which the alias refers, or click **Browse** to navigate to the item.
5. Click **Scaling** to enable scaling for the alias. Click **No Scaling** to disable scaling and hide the **Scaling Options**. The **Scaling Options** are displayed at the bottom of the **Insert New Alias** dialog box (Figure 3-13).
6. Configure the **Scaling Options** as required (see Table 3-16 for a description of these options), by clicking the appropriate tab for the form of scaling required.

   Available forms of scaling include: *linear*, *square root*, *gain/offset*, and simple text *expressions*.
7. Configure the remaining fields as required (see Table 3-15 for a description of the components).
8. Click **Save** to save the alias.

To edit an alias:

1. In the **Configuration Window**, select an alias, and then double-click or press ENTER. The **Edit Alias** dialog box appears.
2. From the **Edit Alias** dialog box, edit the alias.

To remove an alias:

1. In the **Configuration Window**, select one or more aliases.
2. From the **Edit** menu, choose **Delete Alias**. The alias is removed.

To remove an alias group:

1. In the **Configuration Window**, select an **Alias Group**.
2. From the **Edit** menu, choose **Delete Alias Group** or click . The alias group is removed.

To export all currently configured Aliases:

1. From the **File** menu, choose **Export Aliases** or click . The **Export Aliases** dialog box appears.
2. From the **Export Aliases** dialog box, enter a file name for the CSV export file.
3. Click **Save**. The aliases are exported.

To import Aliases from a CSV file:

1. From the **File** menu, choose **Import Aliases** or click . The **Import Aliases** dialog box appears.
2. From the **Import Aliases** dialog box, browse to the CSV file name.
3. Click **Open**. The old aliases are cleared and the new ones are imported.

OPC Data Items

This chapter describes the OPC data items used in the OPC Server for GE SRTP .

GE SRTP Items

The OPC item ID syntax of this OPC server is as follows:

```
Channel.Device.Tagname
```

Where:

- `Channel` is the name assigned to the channel created (pointing to the specific PLC to communicate with) during OPC server configuration.
- `Device` is the Device object.
- Tagname is the name of the tag, either conforming to the standard GE SRTP addressing syntax for standard memory addressing, or the name of a published variable (also sometimes referred to as a Symbolic item). Published variables are available only on a PACSystems™ RX7i or a PACSystems™ RX3i, and are ignored if a connected PLC does not support them.

Available Items

Items that reference the various memory types (or published variables) within the connected PLC Channel are added to the Device level, and use the following form for the various addressable memory types:

```
Channel.Device.%<Memory Type><Memory Location><Data Type>
```

For ASCII (STRING) values, the reference address takes the form:

```
Channel.Device.%<Memory Type><Memory Location>.<String Length>
```

Memory type, memory location, data type, and string length are as described below. Note the decimal (.) before <string length>. Data type is an optional parameter that is available only to non-discrete memory types. Discrete data is always considered Boolean (VT_BOOL).

For published variables, the following form is used:

```
Channel.Device.<Published Variable Name>
```

Any Tagname that does not follow the addressable memory type format (using a % sign at the start of the Tagname), is assumed to be a published variable.

Memory Types

The following memory types are available within the OPC server:

Table 5-1. Memory Types

Discrete Memory	
%I	Discrete Input
%Q	Discrete Output
%T	Discrete Temporary
%M	Discrete Internal
%SA	Discrete system status (A)
%SB	Discrete system status (B)
%SC	Discrete system status (C)
%S	Discrete S system status (read-only)
%G	Genius Global Data

Analog Memory	
%AI	Analog Input
%AQ	Analog Output
%R	Register
%W	Bulk memory (PACS only)

Memory Location

The memory location is a numerical integer value appropriate to the memory type. The valid range depends on the model of the PLC and its configuration

Data Type

Enter the PLC data type of the data, enclosed in square brackets ([and]). This is required only if the memory type indicates a non-discrete memory area (analog memory) and the data is not to be treated as the default data type (INT).

Data Type can be any one of the items in the Data Type column as follows. Only the indicated number of bytes for each data type are acquired from the PLC for the give item. If not specified, Data Type is assumed to be a signed short integer (INT).

Table 5-2. Data Type Qualifiers

Data Types	Bytes	Description	Variant Type
[INT]	2	Signed short integer	VT_I2

Table 5-2. Data Type Qualifiers			
Data Types	**Bytes**	**Description**	**Variant Type**
[REAL4]	4	Floating point (single precision)	VT_R4
[REAL8]	8	Floating point (double precision)	VT_R8
[DINT]	4	Signed integer	VT_I4
[SINT]	1	Signed character (integer)	VT_I1
[UINT]	2	Unsigned short integer	VT_UI2
[USINT]	1	Unsigned character (integer)	VT_UI1

NOTE: *Data arrays are not supported; however, you can read data as a STRING value up to a length of 255.*

String Length

<String Length> can be any integer from 1 to 255. The maximum length of the STRING variable assigned to this reference address must be less than or equal to <String Length>. When addressing ASCII values, <Memory Type> can use only Analog memory areas (%AI, %AQ, %R, and %W).

The driver uses <String Length> to determine how many characters to read or write to the PLC as follows:

- When reading strings from the PLC, a NULL character is treated as an end-of-string indicator. When a NULL character is reached, subsequent characters are ignored.

  If no NULL character is reached, all <String Length> characters are read.

- When writing strings to the PLC, only <String Length> characters are written. No NULL character is appended to the end.

Each register on the PLC can store 2 characters, one character per byte. If the required space for a string value "spills over" the end of the addressable memory space, the I/O address will not work. This occurs when there are not enough registers from address <Memory Location> to the end of the block for the specified memory type.

For example, %R100.17 references a STRING value with a maximum of 17 characters. This requires 9 sequential registers on the PLC, with the last register only half used.

Examples

The following are examples of valid item IDs.

```
Channel.Device.%R01234
Channel.Device.%AI50[DINT]
```

```
Channel.Device.MySymbol
Channel.Device.%R100.17
```

Status Items

The OPC server has a number of informational items off the Channel link. All of these items have the format of:

```
Channel.<Item name>
```

Table 5-3. Status Items

Item Name	Description
Controller ID	These items contain information regarding the PLC version, as well as some information about the Programs loaded into it.
Major PLC CPU Type	
Minor PLC CPU Type	
CPU Model	
Number of Programs	
Program Name	
%R registers	These items contain the memory reference limits of the PLC that the channel is configured to represent. %W and symbolic registers are only available with PACS PLCs, and will return a value of zero for non-PACS PLCs.
%AI registers	
%AQ registers	
%W registers	

Table 5-3. Status Items	
Item Name	**Description**
%I registers	
%Q registers	
%M registers	
%T registers	
%SA registers	
%SB registers	
%SC registers	
%S registers	
%G registers	
Symbolic (Bool) registers	
Symbolic (Non Bool) registers	

Control Items

The OPC server has a number of control items off each configured Device link. These items either hold data from the PLC fault tables, or act as triggers for the OPC server to read the PLC fault table data. All of these items have the format:

```
Channel.Device.<Item name>
```

Table 5-4. Control Items

Item Name	Description
PLC Fault table	These items hold the received fault table data for the appropriate fault table. The data is formatted as an array of BYTES (VT_ARRAY | VT_UI1).
I/O Fault table	
Read I/O fault table	These items are triggers for the OPC server to read the fault table data, populating the data into the previous items. The value of these items is meaningless, but if any value is written to these items, they will trigger the OPC server to read the appropriate fault table.
Read I/O fault table	

Diagnostics

The OPC server supplies diagnostic information to assist operators and support personnel with troubleshooting communication problems and software faults.

Logging

All OPC Servers for GE SRTP produce log files that record errors and debugging information. If difficulties occur with an OPC server, then the log files can be extremely valuable for troubleshooting. By default, OPC servers log very little information. The **General Logging** tab of the **Options** dialog in the main configuration window contains settings to control OPC server logging.

General Activity Logging records information about the internal operations of the OPC server. It is useful for troubleshooting problems with configuration and device communication. Interface Activity Logging records information about the OPC client/server communication. It is useful for troubleshooting compliance issues.

The higher the log level, the more information is recorded. However, OPC server performance may decrease at higher log levels. The recommended operating level is *Medium*. Higher log levels are available for both types of logging which record more detailed information, as well as the ability to output log statements to a console window at run time. Contact GE Fanuc Customer Care for further instructions on how to enable the higher log levels and console logging.

In general, the OPC server logs all errors and other information of immediate importance to the user at the low detail level, all warnings and other information of moderate importance to the user at a medium detail level, and additional information concerning the normal functioning of the software at a high detail level. The OPC server logs also further information of concern to support personnel at debug detail level.

Statistics

Under the Current configuration window, several statistics are displayed. Currently, the server uses only the Sent, Received, and Failed statistics.

- **Sent** is the number of messages sent to all connected clients.
- **Received** is the number of messages received from all connected clients.
- **Failed** indicates a network failure.

Troubleshooting

The following sections address some of the most common problems encountered while using this OPC server.

- Problems and Solutions
- Questions and Answers

Problems and Solutions

Please check the following list of **Problems and Solutions** before contacting GE Fanuc support.

- OPC server shuts down after 5 minutes when no OPC clients are connected
- Cannot configure OPC client access paths, so cannot configure item options
- OPC server cannot be configured: no OPC Server for GE SRTP logo in Tool Tray
- OPC client unable to create or read items under configured object (device).
- OPC server does not retain settings
- OPC server cannot save configuration in XML format
- OPC server does not show as a local program in OPC client application
- OPC server does not show as a remote program in OPC client application
- Access Denied or time-out error when connecting to a remote OPC server via DCOM
- OPC server does not start or OPC client cannot connect
- About screen and Configuration Window do not show
- DA 2.0 asynchronous I/O doesn't work
- Device Failure occurs during switchover using PACSystems RX7i Redundancy Support

OPC server shuts down after 5 minutes when no OPC clients are connected

Problem: The OPC server shuts down automatically after 5 minutes when no OPC clients are connected.

Solution: This is standard behavior for COM servers.

To override this behavior:

1. Create a string value named **LockServer** in:

   `HKEY_CLASSES_ROOT\CLSID\{024C7FFC-9CC3-476f-867A-BC3CAD79F4FE}\Options`

   To create a new value, select the **Options** key, and then choose **New String Value** from the **Edit** menu.

2. Set the value of the **LockServer** entry to `1`.

To edit the value, select the entry and choose **Modify** from the **Edit** menu (Figure 6-1).

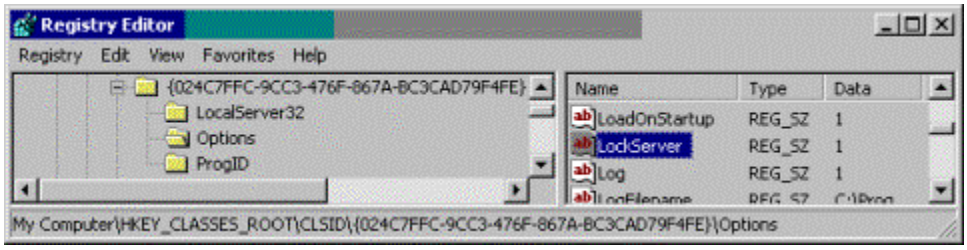


Figure 6-1. Editing the LockServer entry.

3. Shut down the OPC server and restart it to have the change take effect.

Cannot configure OPC client access paths, so cannot configure item options

Problem: The OPC client does not provide a means to configure access paths, making it difficult to correctly specify the data acquisition options for the items.

Solution: The OPC server provides a global parameter for configuring an escape character, allowing users to append communication options to the end of an **Item ID** to accommodate OPC clients that do not support access paths.

To edit these parameters:

1. Create a string value named `ItemIDEscapeCharacter` in:

   `HKEY_CLASSES_ROOT\CLSID\{024C7FFC-9CC3-476f-867A-BC3CAD79F4FE}\Options`

   To create a new value, select the **Options** key, and then choose **New String Value** from the **Edit** menu.

2. Set the value of `ItemIDEscapeCharacter` to a single character, such as "|" (pipe).

   To edit the value, select the entry and choose **Modify** from the **Edit** menu.

3. Shut down the OPC server and restart it to have the change take effect.

4. Configure the `ItemIDEscapeCharacter` **Item ID** in the OPC client with the access path appended to the end with the configured escape character (e.g., `ITEMID|ACCESSPATH`).

OPC server cannot be configured: no OPC Server for GE SRTP logo in Tool Tray

Problem: The OPC server cannot be configured because there is no OPC Server for GE SRTP logo in the **Tool Tray**.

Solution: If the OPC server is running as a service, you will not see the OPC Server for GE SRTP logo in the **Tool Tray** that indicates the OPC server is running.

To configure the OPC server, start the configuration utility by using the shortcut to the OPC server in the Windows **Start** menu (this shortcut starts the **Configuration** utility as well as the OPC server).

OPC client unable to create or read items under configured object (device).

Problem: The OPC client is unable to create or read items under a configured object (device).

Solution: Check the object configuration. Ensure that the **Enabled** checkbox is selected.

OPC server does not retain settings

Problem: The OPC server does not retain its previous settings and needs to be reconfigured each time it starts up.

Solution: In the **Configuration Window**, choose **Options** from the **View** menu. Under the **General** tab, ensure that the **Load configuration on start-up** checkbox is selected and that the correct file name appears in the edit box (see the General Options section).

OPC server cannot save configuration in XML format

Problem: The OPC server cannot save the configuration in XML format.

Solution: Microsoft Internet Explorer 4.01 (or later) must be installed to use the .XML format.

OPC server does not show as a local program in OPC client application

Problem: The OPC server does not show in a list of locally available program IDs in my OPC client application.

Solution: Make certain that a user with local administrative rights installs the OPC server so that it can create the necessary entries in the registry.

Also, especially for older OPC clients that do not use the OPC Server Browser, make certain that the OPC client is running as a user that has *read* access to the registry.

OPC server does not show as a remote program in OPC client application

Problem: The OPC server does not show in a list of remotely available program IDs in my OPC client application.

Solution: Follow the steps found in Appendix A -Distributed COM (DCOM) to copy the program ID from the OPC server machine to the OPC client machine.

Access Denied or time-out error when connecting to a remote OPC server via DCOM

Problem: ***Access Denied*** error or time out trying to connect to a remote OPC server via DCOM.

Solution: Ensure that the access and launch permissions for the OPC server are correctly set on the OPC server machine. For more information, see Appendix A -Distributed COM (DCOM).

OPC server does not start or OPC client cannot connect

Problem: An OPC client tries to connect to the OPC server and fails, or the OPC server does not start.

Solution: Ensure that the access and launch permissions for the OPC server are set correctly. For more information, see Appendix A -Distributed COM (DCOM).

About screen and Configuration Window do not show

Problem: The **About** screen and **Configuration Window** do not show when a remotely connecting OPC client or an OPC client that runs as a Windows NT service (such as the Aspen Technologies CIMIO OPC Manager) tries to launch the OPC server.

Solution: Either set the identity for the OPC server to the interactive user, or else run the OPC server as a Windows NT service. For more information, see Appendix A -Distributed COM (DCOM).

DA 2.0 asynchronous I/O doesn't work

Problem: After installing an older OPC server, DA 2.0 asynchronous I/O no longer works.

Solution: The old installation program installed and registered its own (older) version of the OPC proxy/stub DLL.

Reinstall the standard OPC proxy/stub DLLs, using an up-to-date installation program or re-register them using the `REGSVR32` command-line utility (see the Installation section).

Device Failure occurs during switchover using PACSystems RX7i Redundancy Support

Problem: One device is set up for the redundant pair of PACs with the IP Address for the device specified as the Redundant IP Address set up in the PACs. The active PAC will respond to the messages sent by the GES OPC Server.

If the PACs switch roles (for example, if the Primary PAC is active and fails, the Secondary PAC takes over as the active PAC) and the GES OPC Server performs a poll during this switchover, the poll will fail and Device Failure will be seen. Data points associated with the device may see the quality go to BAD for a brief period.

Solution: When the switchover is complete and the Secondary PAC becomes active, all subsequent polls to the Redundant IP Address will succeed and the active (Secondary) PAC will respond with the data.

Questions and Answers

In addition, the following questions are answered in the Question and Answer section:

- Question: How do I remove the server as a service?
- Question: Does the server need to be started manually when installed as a service?
- Question: How can I access individual bits from an integer item?

Question: How do I remove the server as a service?

Answer: Reregister the OPC server executable using the `/REGSERVER` command-line switch.

Question: Does the server need to be started manually when installed as a service?

Answer: No, the first OPC client that tries to connect starts the OPC server.

Question: How can I access individual bits from an integer item?

Answer: Create an alias (see the Alias Configuration section) that references the desired item and configure scaling for the alias to use expression evaluation. Edit the input expression to use binary math to access a particular bit (for example, IF((INPUT AND 4)=4, 1, 0) to access bit **2**). This method allows *read* access only.

OPC Compliance

For more information on OPC, view the documents listed below (as well as others) at http://www.opcfoundation.org.

- OPC Overview 1.0
- OPC Common Definitions and Interfaces 1.0
- OPC Security Custom Interface 1.0
- OPC Data Access Custom Interface Standard 2.05

The OPC server passes the automated certification test with the **OPC Foundation Compliance Test** utility.

Installation

The OPC server installs itself as a local out-of-process COM OPC server and enters its registration information in the Windows registry when instructed to do so with the `/REGSERVER` command-line option. The OPC server installs itself as a Windows NT/2000 service and enter its registration information in the Windows registry when instructed to do so with the `/SERVICE` command-line option.

- Version-independent program ID GEFanuc.GES.OPCServer
- Version-specific program ID GEFanuc.GES.OPCServer.1
- OPC sub-key and vendor information string
- Globally unique application ID number {7CF1E5F4-7CDC-44B9-B651-C96427CC459B}
- Globally unique class ID number {7CF1E5F2-7CDC-44B9-B651-C96427CC459B}
- Globally unique configuration ID number {7CF1E5F3-7CDC-44b9-B651-C96427CC459B}
- Full path of 32-bit local OPC server executable
- OPC Data Access Server 1.0 and 2.0 implemented component categories

The OPC server removes its registration information from the Windows registry when commanded to do so with the `/UNREGSERVER` command-line option.

Common Interfaces

The OPC server supports the mandatory functionality specified in **OPC Common Definitions and Interfaces**. The OPC server supports the following locales for result code translation: US English (0x0409), system default (0x0800), user default (0x0400), and neutral (0x0000).

The OPC server allows the OPC client to set the OPC client name for each connection. The OPC server supports the shutdown event notification OPC client-side interface.

Data Access

The OPC server supports the mandatory functionality specified in the **OPC Data Access Custom Interface Standard**.

Groups

The OPC server supports the addition, removal, and cloning of private groups. The OPC server also allows the OPC client to manage group state. Group properties include:

- Name
- Active state
- Update rate (100 millisecond resolution)
- Time bias
- Dead-band (percent of analog item high-low range)

Items

The OPC server supports the addition, removal, and validation of items in a group. The OPC server also allows the OPC client to manage item configuration. Item configurations include:

- Active state
- Requested data type

Browsing and Item Properties

The OPC server supports address space browsing with the following features:

- Hierarchical address space
- Simulation of flat address space
- Branch/leaf name filter (pattern matching)
- Item data type filter
- Item access rights filter

The OPC server supports the following mandatory item properties:

- Value, quality, and timestamp
- Canonical data type
- Access rights
- Scan rate

I/O Operations

The OPC server supports the following synchronous I/O operations:

- Read active item values from cache.
- Read item values from devices.

- Write control values to items on devices.

The OPC server supports the following asynchronous I/O operations as defined for **DA 2.0**.

- Read items values from devices.
- Write control values to items on devices.
- Refresh active items from cache.
- Cancel outstanding operations.
- Enable/disable event notifications.

The OPC server supports the data change event notification OPC client-side interface as defined for **DA 2.0**. Events include:

- Data change or dead-band exceeded
- Asynchronous refresh operation complete
- Asynchronous read operation complete
- Asynchronous write operation complete
- Asynchronous operation cancellation complete

The OPC server supports asynchronous I/O operations as defined for **DA 1.0a**. Operations include:

- Read items values from device.
- Read items values from cache.
- Write control values to items on devices.
- Refresh active items from cache.
- Cancel outstanding operations.

The OPC server supports the data change event notification OPC client-side interface as defined for **DA 1.0a**. Events include:

- Data change or dead-band exceeded data with time stamps
- Data change or dead-band exceeded data without time stamps
- Asynchronous write operation complete

Appendices

Click the following links for additional information about DCOM, Aliases, Standard Data Types, and Data Types in common Products.

- Appendix A - Distributed COM (DCOM)
- Appendix B - ALIASES
- Appendix C - Standard Data Types
- Appendix D - Data Types in Common Products

Appendix A - Distributed DOM (DCOM)

DCOM is an object protocol that enables COM components (such as OPC clients and OPC servers) to communicate directly with each other across a network. A certain amount of configuration is required on the system where the OPC server is installed to allow remote OPC clients to connect to it over the network.

NOTE:*The following sections contain only general tips and information. Ask your Windows NT/2000 System Administrator for details on settings for your system, especially for access across domains.*

Readers should be familiar with DCOM and with Windows 2000 security features and security administration. Information regarding Distributed COM and various links to related sites, white papers, specs, and so on, can be found at http://www.microsoft.com/com/tech/DCOM.asp.

Specifications on DCOM/COM and release notes on COM+ can be found in the MSDN Online Library at http://www.microsoft.com/com/resources/specs.asp.

DCOM Configuration Utility

Start the DCOM configuration utility either from the OPC server configuration utility or from the command-line (execute the `DCOMCNFG command`). Answer **yes** to any message boxes that appear, allowing the utility to assign application ID entries to those OPC servers that don't already have them.

The main window for ***DCOMCNFG*** allows the user to either configure default settings for all COM OPC servers, or else to configure settings for a specific OPC server chosen from the list. The former affects all OPC servers configured to use the default settings; the latter affects the selected OPC server only.

NOTE: *DCOM settings are stored in the registry and loaded by COM and OPC servers at start-up. Therefore, OPC server processes must be shut down and restarted in order for these changes to take effect.*

Default Properties

The **Default Properties** tab contains settings that affect all DCOM communication on the machine.

1. Ensure that the **Enable Distributed COM on this computer** is selected in so that the machine is available to others via DCOM.
2. Select the **Enable COM Internet Services on this computer** to allow DCOM access to the

machine from the Internet (check with your administrator). In general, the other settings do not need to be changed.

The **Authentication Level** specifies when COM should authenticate the identity of calling OPC clients (each call, each packet, and so on).

- Normally, it should be set to **Connect**, indicating that COM should authenticate OPC clients when they first connect to an OPC server. If it is set to **None**, then COM performs no authentication and ignores any access permission settings.

The **Impersonation Level** specifies whether OPC servers can ascertain the identity of calling OPC clients and whether they can then perform operations on the OPC client's behalf (as if the OPC server is the OPC client).

- Normally, it should be set to **Identify**, allowing the OPC server to identify the calling OPC client to see if it is allowed access to a certain resource but not to actually access any of these resources as the OPC client.
- Select **Provide additional security for reference tracking** to make even the reference counting on COM objects secure. This setting is not generally required.

Security Permissions

The most important DCOM settings for an OPC server are the security permissions.

There are two ways to set these:

- Change the specific settings for the OPC server (recommended).

  - or -

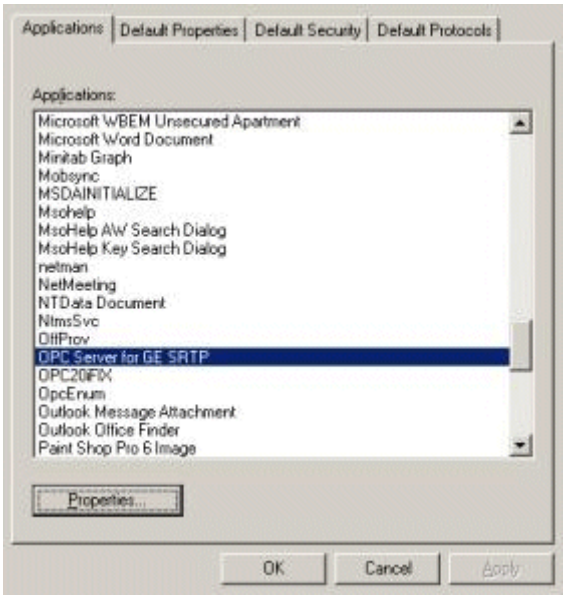
- Change the default settings (not recommended) and make sure that the OPC server uses these.

In both cases, ensure that the access and launch permissions are correct for the OPC server.

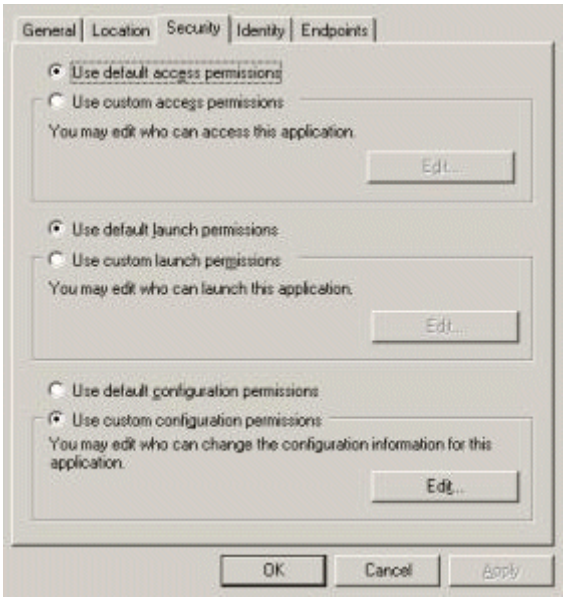
Setting Security Permissions:

To set the security permissions for an OPC Server:

1. Open the DCOM configuration utility.
2. Select the OPC server, and then click **Properties**. The **Distributed COM Configuration Properties** dialog box appears.



3. Click on the **Security** tab to set the security for the OPC server. The **Distributed COM Configuration Security** tab appears.

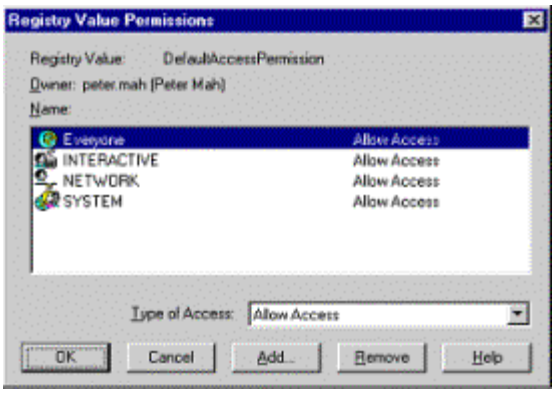


The **Access Permissions** contain an *Access Control List* of principals that are allowed to interact with objects supplied by an OPC server.

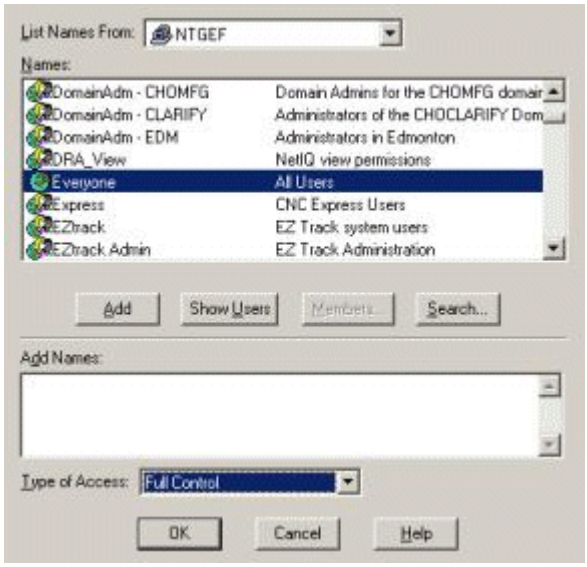
The **Launch Permissions** contain an *Access Control List* of principals that are allowed to start an OPC server process or service.

4. Include the names of users or user groups from trusted domains that you wish to be able to use the OPC server on this machine. Include the **Everyone** group to allow access to all users on a particular domain.

5. To set the *Access* permissions, click **Use custom access permissions** and then click **Edit**. The **Registry Value Permissions** dialog box appears.



6. To add users to the list click **Add**. The **Add Users and Groups** dialog box appears.



7. To add a user to the list, select the user, and then click **Add**. If the user to be added does not appear, then click **Show Users**.
8. When all users have been added, click **OK** to close the **Add Users and Groups** dialog box. You can then choose **Read**, **Full Control**, or **Special Access** for each user.

   The procedure to set the launch permissions is similar to the above, but instead of choosing **Allow Access** for a user, choose **Allow Launch**.

   The Configuration Permissions contain an *Access Control List* of principals that are allowed to modify the configuration information for an OPC server. In other words, it indicates who is allowed to alter the registry entries for installed OPC servers as well as who can access the registry for the purposes of installing new OPC servers. It is usually simpler to install and configure OPC servers as a user with local administrative rights.
9. To connect to an OPC server from outside of the domain, create a local user account on both the OPC server and the OPC client machine with identical *username* and *password*. Then, add the local user on the OPC server to the DCOM permissions. Use the local account on the OPC client machine to connect to the OPC server.

OPC Server Identity

The **Identity** tab for a selected COM (or OPC) server specifies the user account that should be used when COM starts the process. The available settings are different for servers that run as local

executables as opposed to those that run as Windows NT services.

NOTE: *It is strongly recommended that OPC servers should be installed to run as Windows NT services if they are going to be accessed by remote OPC clients via DCOM. This ensures that the OPC server can always be accessed even if no one is presently logged on to the machine, and only one OPC server process ever starts up. It also adds a greater degree of security in terms of who is able to shut down the OPC server process.*

OPC servers that run as local executables have the option of running as the launching user (default: the calling OPC client), the interactive user (the one currently logged onto the machine), or a specified user. It is usually best to use the interactive user or a specified user. Otherwise, remote OPC clients might start multiple separate OPC server processes that are not accessible to others.

OPC servers that run as Windows NT services should generally run as the local **System** account. Alternatively, the OPC server can be set to run as a specified user, although this is usually done from the **Service Control Manager** applet rather than DCOMCNFG. *Access* and *Launch* permissions are particularly important when installing an OPC server to run as a Windows NT service.

Default Protocols

The **Default Protocols** tab specifies the communication protocols available to DCOM. The order that protocols appear in the list indicates the priority in which they are used (the topmost having the highest priority).

The more protocols that appear in the list, the better the chances of connecting to an OPC server on an unknown remote machine (such as at an OPC Interoperability Workshop). However, it may also take longer for DCOM to time out if an OPC server machine is not present since it tries each protocol in turn.

Normally, it is best to remove all unused protocols from the list and only include those that are necessary for your network. For example, on a TCP/IP network, include the **Connection-oriented TCP/IP** protocol. Contact your IT personnel for more information about your network.

NOTE: *Evidence indicates that there are problems with the datagram-oriented protocols (such as UDP/IP) that can cause memory leaks in DCOM. We strongly recommend that these protocols be removed from the list of default protocols. Datagram-oriented protocols are not supported under Windows 2000, although the DCOM configuration utility allows you to configure them.*

Remote Program ID

Before the **OPC Server Browser** became available, OPC client applications had to search the registry to generate a list of available OPC servers. Therefore, some older OPC clients need to have a program ID in the local registry in order to connect to a particular OPC server.

The simplest solution is to install the OPC server software on the OPC client machine even if it is not used. Alternatively, use the following steps to copy a program ID to the OPC client machine.

NOTE: *This method may not work for every OPC client. Please check the OPC client documentation for more information.*

1. On the OPC server machine, run **REGEDIT** as a user that has access rights to the local registry.
2. Expand the **HKEY_CLASSES_ROOT** key.
3. Find the program ID(s) for the desired OPC server(s).

   In the case of OPC Servers for GE SRTP, the ID has the form *GEFanuc.GES.OPCServer*. Quickly type the first few letters for **REGEDIT** to jump to the location of that key. Some

OPC servers may have both a version-specific as well as a version-independent program ID. In this case both ID's should be copied to the OPC client machine.

4. For each program ID, select the key and choose **Export Registry File** from the **Registry** menu. Enter a file name, and then click **Save**. Be careful not to overwrite other export files being created.
5. Copy the exported **REG** files to the OPC client machine.
6. Merge the **REG** files into the registry of the OPC client machine by double-clicking the file from the desktop of the OPC client machine. Alternatively, run **REGEDIT** on the OPC client machine and choose **Import Registry File** from the **Registry** menu, selecting each file in turn. You must have write access to the local registry.
7. Use **REGEDIT** to check that the program IDs have in fact been copied.
8. Delete the **REG** files since they are no longer needed.

Appendix B - ALIASES

Scaling Expressions

Alias scaling expressions may use any of the expression constructs listed in Table B-1.

Table B-1 Expressions Constructs for Alias Scaling

Construct	Description	Examples
‘text’	Text value (single quotation marks).	‘hello’ ‘Joe’’s Alias’
+ - * /	Addition (or Append), Subtraction, Multiplication, and Division.	(3 * 7 + 1) / 8 – 2 ‘hi’ + ‘there’
= < > <> <= >=	Equal To, Less Than, Greater Than, Unequal To, Less or Equal To, Greater or Equal To.	3 < 4
Not And Or	Logical Not, Logical And, Logical Or May also be used for binary math.	(7 >= 3) And (1 <> 0) (12 And 5) = 4
TIME	Current time as text.	‘The time is’ + TIME

Table B-1 Expressions Constructs for Alias Scaling		
Construct	**Description**	**Examples**
DATE	Current date as text.	'Today is' + DATE
INT(x)	Returns the integer part of x.	INT(3.14) = 3
FRAC(x)	Returns the fractional part of x.	FRAC(3.14) = 0.14
SQRT(x)	Returns the square root of x.	SQRT(16) = 4
DIV(x, y)	Divides x by y.	DIV(42, 7) = 6
IF(expr, x, y)	Returns x if expression evaluates to TRUE, otherwise returns y.	IF(6 <= 12, 'OK', 'Bad') = 'OK'
TRUE FALSE	Constant Boolean true and false.	(5 > 6) = FALSE
TYPEOF(x)	Returns the data type of x as a text description ('STRING', 'INTEGER', 'FLOAT, 'BOOLEAN', 'ERROR').	TYPEOF('hello') = 'STRING'
STR(x)	Converts the numeric value x to text.	STR(3.14) = '3.14'
UPPER(x) LOWER(x) PRETTY(x)	Converts the text value x to all upper case or lower case letters, or the first letter upper case and the rest lower.	UPPER('alarm') = 'ALARM' LOWER('ALARM') = 'alarm' PRETTY('ALARM') = 'Alarm'

Table B-1 Expressions Constructs for Alias Scaling		
Construct	**Description**	**Examples**
COPY(x, start, length)	Returns a sub-string of the x, copying length characters starting at start.	`COPY('FIDDLE', 2, 4) = 'IDDL'`
FORMATNUMERIC(mask, x)	Converts the numeric value x to text using the format mask.	`FORMATNUMERIC('####.#', 123.4567) = '123.5'`
INPUT	The incoming value read from OPC.	`INPUT * 3.1415`
OUTPUT	The outgoing value written to OPC.	`OUTPUT / 3.1415`
'text'	Text value (single quotation marks).	`'hello'` `'Joe''s Alias'`

Alias Import/Export CSV File Format

The alias import/export file contains lines of comma-separated values. Values containing commas or spaces are enclosed in double-quotation marks (“”). Double-quotation marks occurring inside quoted values are escaped with an extra double-quotation mark. Lines beginning with a hash mark (#) are ignored (used for comments). Each line contains the fields listed in Table B-2.

Table B-2 Field Descriptions for File Import/Export	
Field	**Description**
Alias Group	Name of the alias group folder where the alias belongs. Periods in the name indicate subfolders below the root (for example “North.FIC101” is alias group "North" under the Alias Configuration root and alias group "FIC101" under that).
Alias Name	Name of the alias. Full alias path name composed of the alias group path, a period, and the alias name (for example “North.FIC101.CV” for an alias named “CV”).
Item Path	Fully qualified item ID for the OPC item to which the alias refers.

Table B-2 Field Descriptions for File Import/Export	
Field	**Description**
Data Type	Decimal number indicating the data type for the alias.
Read-only	Specifies whether the alias is read-only or read-write. 0 = read-write 1 = read-only
Poll Always	Specifies whether or not the alias is continuously polled. 0 = only poll as requested by an OPC client (normal) 1 = poll continuously at the specified update rate
Update Rate	Update rate (milliseconds) to use with the Poll Always option.
Scaling	Scaling type for the alias 0 = none 1 = linear 2 = square root 3 = gain/offset 4 = expression

When the scaling field specifies linear (1) or square root (2) scaling, the line contains the additional fields listed in Table B-3.

Table B-3 Additional Field Descriptions for File Import/Export: Linear or Square Root Scaling	
Field	**Description**
High Raw	Raw value range (double-precision real).
Low Raw	
High Scaled	Scaled value range (double-precision real).
Low Scaled	

Table B-3 Additional Field Descriptions for File Import/Export: Linear or Square Root Scaling	
Field	**Description**
Clamp	Clamp options 0 = none 1 = clamp low value 2 = clamp high value 3 = clamp both high and low values

When the scaling field specifies gain/offset (3) scaling, the line contains the additional fields listed in Table B-4.

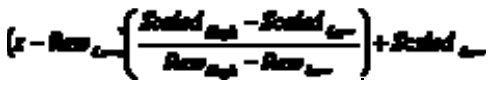
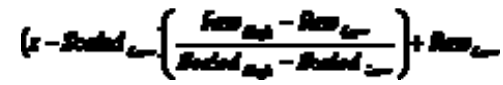
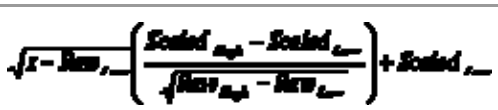
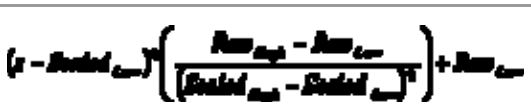
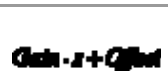
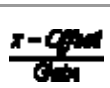
Table B-4 Additional Field Descriptions for File Import/Export: Offset Scaling	
Field	**Description**
Gain	Scaling factor (double-precision real).
Offset	Scaling offset (double-precision real).

When the scaling field specifies expression (4) scaling, the line contains the additional fields listed in Table B-5.

Table B-5 Additional Field Descriptions for File Import/Export: Linear or Square Root Scaling	
Field	**Description**
Input Expression	Simple formula applied to the value read from the OPC item.
Output Expression	Simple formula applied to values written to the OPC item. The output formula should be the reciprocal of the input formula.

Scaling Algorithms

For each type of scaling, a different algorithm (Table B-6) is applied to values read from the OPC item. A reverse algorithm is applied to any values written to the OPC item.

Table B-6 Scaling Algorithms		
Scaling	**Algorithm/Example**	**Reverse Algorithm/Example**
Linear		
Square Root		
Gain/ Offset		
Expression	`SQRT(INPUT) + 5`	`(OUTPUT – 5) * (OUTPUT – 5)`

Appendix C - Standard Data Types

Table C-1 Expression Constructs for Alias Scaling				
Hex	**Dec**	**Data Type**	**Expression Data Type**	**Description**
0000	0	(Default)	VT_EMPTY	Default/Empty (nothing)
0002	2	SHORT	VT_I2	2-byte signed integer
0003	3	LONG	VT_I4	4-byte signed integer
0004	4	REAL4	VT_R4	4-byte (single-precision) real
0005	5	REAL8	VT_R8	8-byte (double-precision) real
0006	6	CURRENCY	VT_CY	Currency

Table C-1 Expression Constructs for Alias Scaling				
Hex	**Dec**	**Data Type**	**Expression Data Type**	**Description**
0007	7	DATE	VT_DATE	Date
0008	8	STRING	VT_BSTR	Text (UNICODE)
000A	10	N/A	VT_ERROR	Error code
000B	11	BOOLEAN	VT_BOOL	Boolean (TRUE = -1, FALSE = 0)
0011	17	CHAR	VT_I1	1-byte signed integer
0012	18	BYTE	VT_UI1	1-byte unsigned integer
0013	19	USHORT	VT_UI2	2-byte unsigned integer
0014	20	ULONG	VT_UI4	4-byte unsigned integer
2002	8194	ARRAY OF SHORT	VT_ARRAY | VT_I2	Array of 2-byte signed integers
2003	8195	ARRAY OF LONG	VT_ARRAY | VT_I4	Array of 4-byte signed integer
2004	8196	ARRAY OF REAL4	VT_ARRAY | VT_R4	Array of 4-byte (single-precision) real
2005	8197	ARRAY OF REAL8	VT_ARRAY | VT_R8	Array of 8-byte (double-precision) real
2006	8198	ARRAY OF CURRENCY	VT_ARRAY | VT_CY	Array of currency values

Table C-1 Expression Constructs for Alias Scaling				
Hex	**Dec**	**Data Type**	**Expression Data Type**	**Description**
2007	8199	ARRAY OF DATE	VT_ARRAY | VT_DATE	Array of dates
2008	8200	ARRAY OF STRING	VT_ARRAY | VT_BSTR	Array of text values
200A	8202	N/A	VT_ARRAY | VT_ERROR	Array of error codes
200B	8203	ARRAY OF BOOLEAN	VT_ARRAY | VT_BOOL	Array of Boolean values
2011	8209	ARRAY OF CHAR	VT_ARRAY | VT_I1	Array of 1-byte signed integers
2012	8210	ARRAY OF BYTE	VT_ARRAY | VT_UI1	Array of 1-byte unsigned integers
2013	8211	ARRAY OF USHORT	VT_ARRAY | VT_UI2	Array of 2-byte unsigned integers
2014	8212	ARRAY OF ULONG	VT_ARRAY | VT_UI4	Array of 4-byte unsigned integers

Appendix D - Data Types in Common Products

Table D-1 Comparison of equivalent Data Types as used in OPC, Proficy HMI/SCADA - CIMPLICITY™, and Proficy HMI/SCADA - iFIX™		
OPC server for GE SRTP	**Proficy HMI/SCADA - CIMPLICITY**	**Proficy HMI/SCADA - iFIX**
(Default) Empty	N/A	N/A

Table D-1 Comparison of equivalent Data Types as used in OPC, Proficy HMI/SCADA - CIMPLICITY™, and Proficy HMI/SCADA - iFIX™		
OPC server for GE SRTP	**Proficy HMI/SCADA - CIMPLICITY**	**Proficy HMI/SCADA - iFIX**
SHORT	INT	SHORT
LONG	DINT	LONG
REAL4	REAL	FLOAT
REAL8	REAL	DOUBLE
CURRENCY	N/A	N/A
DATE	N/A	N/A
STRING	STRING STRING8 STRING20 STRING80	STRING
BOOLEAN	BOOLEAN	BOOLEAN
CHAR	SINT	N/A
BYTE	USINT	BYTE
USHORT	UINT	N/A
ULONG	N/A	N/A
ARRAY OF SHORT	ARRAY OF INT	ARRAY OF SHORT
ARRAY OF LONG	ARRAY OF DINT	ARRAY OF LONG
ARRAY OF REAL4	ARRAY OF REAL	ARRAY OF FLOAT

Table D-1 Comparison of equivalent Data Types as used in OPC, Proficy HMI/SCADA - CIMPLICITY™, and Proficy HMI/SCADA - iFIX™

OPC server for GE SRTP	Proficy HMI/SCADA - CIMPLICITY	Proficy HMI/SCADA - iFIX
ARRAY OF REAL8	ARRAY OF REAL	ARRAY OF DOUBLE
ARRAY OF CURRENCY	N/A	N/A
ARRAY OF DATE	N/A	N/A
ARRAY OF STRING	ARRAY OF STRING ARRAY OF STRING8 ARRAY OF STRING20 ARRAY OF STRING80	ARRAY OF STRING
ARRAY OF BOOLEAN	ARRAY OF BOOLEAN	ARRAY OF BOOLEAN
ARRAY OF CHAR	ARRAY OF SINT	N/A
ARRAY OF BYTE	ARRAY OF USINT	ARRAY OF BYTE
ARRAY OF USHORT	ARRAY OF UINT	N/A
ARRAY OF ULONG	N/A	N/A

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